

DOH ARBOVIRUS WEEKLY UPDATE

August 17, 2003

West Nile virus is an emerging infectious disease, and only appeared in the eastern United States in 1999. In 2002, the virus spread to forty-four states in the United States; Oregon, Nevada, Utah and Arizona documented no West Nile virus activity. As of 13 August 2003, West Nile virus has been detected in 42 states. Verified human cases have occurred in 23 of those 42 states. As part of the West Nile virus surveillance system, the Department of Health (DOH) conducts human, avian, mammal and mosquito surveillance and keeps extensive database and spreadsheet records detailing the surveillance. DOH established a West Nile virus Call Center number at 202-535-2323, a health care and question line at 202-671-0733 and extensive web site information at <http://www.dchealth.dc.gov/>.

The chances of developing symptoms of West Nile virus from the bite of a mosquito are very remote. Much less than one percent of mosquitoes test positive for the virus in areas where the virus is present. And, if bitten by an infected mosquito, a person has less than a one percent chance that he or she will develop symptoms. Generally, the symptoms are very mild and may not even be noticed. Only in very rare cases will the symptoms be severe. Individuals over the age of 60 are the population most at risk. For 2002, the median age for human disease was fifty-five and the median age for mortality was 78. For 2003, the median age of WNV positive human cases is 46. Any person who suspects that they have the virus should contact their doctor immediately.

DOH has trained staff to assist residents with identifying and eliminating potential mosquito-breeding sites and to speak at neighborhood meetings and health fairs. The fundamental components of the West Nile virus plan are prevention and personal protection.

The West Nile virus program is a fluid program that is continually evaluated and altered to protect the public. Mosquito surveillance has been enhanced to assess the risk to public health and safety in the District. It is paramount to track positive mosquito pools and species. As a result of this increased mosquito surveillance, new species of mosquitoes have been identified as positive for West Nile virus in the District.

In 2002, six pools of *Aedes albopictus* tested positive in the District. This species is a daytime human biter and causes increased concern. Previously only *Culex spp.*, a dawn and dusk feeder, tested positive. As a result, DOH has added precautions of protecting residents against mosquito bites at all times during the day and not just dawn and dusk.

Nationally, per CDC, in 2002, there were 4156 cases of West Nile virus infection, including 284 deaths, in the United States. The outbreak was the largest since the virus first appeared in the Western Hemisphere 4 years ago. During the 2002 outbreak, CDC officials confirmed the first known cases in which West Nile was transmitted through organ transplants and blood transfusions. The possibility the virus could be spread through breast milk or sexual contact also has been studied. Although most people who

contract West Nile have no symptoms and those who do normally suffer little more than flu-like illness, it is believed they still can carry small amounts of the virus in their blood for several days.

Excerpt from transcript of CDC press conference on diagnostics

[The following information was contributed by Dr Jay Epstein of the Food and Drug Administration.]

The FDA has cooperated closely with CDC and National Institutes of Health, as well as the blood organizations in both the laboratory and epidemiological investigations of West Nile virus, and we continue to work cooperatively to develop appropriate responses to protect the blood supply. Also, we've worked closely with the product manufacturers to expedite development of necessary medical products, such as screening and diagnostic tests for West Nile Virus. And I would emphasize that FDA is highly committed to working with the industry to help bring safe and effective products to market. More specifically, since August of 2002, FDA provided alert notices, and then later in October, guidance to blood establishments on procedures to avoid the collection and use of blood that might be at risk for transmitting West Nile virus. FDA updated its current guidance in May 2003, based on experience with the 2002 epidemic.

Also, we've worked with device manufacturers and the blood organizations to facilitate the development and rapid availability of experimental donor screening tests for West Nile virus. These tests were put into place in the areas of highest risk, starting in mid-June and have been available nationwide throughout the country since 1 Jul 2003. Because of this screening test, as well as the recent policies on acceptance of donors, the blood supply is even safer this year than before.

In addition, FDA recently cleared the first diagnostic test for uses and aid in the clinical laboratory diagnosis of infection with West Nile virus, and we're also cooperating with early stage efforts to develop a vaccine for West Nile virus and potentially to facilitate use under approved research of a possible therapy, based on use of antibodies.

Regarding the donor screening tests, there are two West Nile virus test kit manufacturers, namely GemProbe, Incorporated, of San Diego, California, and Roche Molecular Systems, Incorporated, of Pleasanton, California, that are making investigational tests available to the blood collection centers under FDA-approved procedures. Although still experimental, these tests are very sensitive, and we believe that they can prevent contaminated blood from entering the nation's blood supply and therefore add a safety measure. These tests detect RNA of the West Nile virus, and they're similar to tests already licensed to screen blood donors for evidence of infection with HIV and hepatitis C virus. In fact, these investigative procedures successfully

identified the first human West Nile infection in an asymptomatic blood donor, and the products in question were removed prior to distribution, thereby, preventing exposure of blood recipients. This was also the first case report in 2003 of a human infection by West Nile virus, although later reports have indicated that there were some earlier cases.

Now, in regard to the recently approved or actually cleared diagnostic test, this clearance took place on 8 Jul 2003. It is a test for West Nile virus antibodies that is manufactured by PANBIO. That's a medical diagnostic corporation located in Queensland, Australia. The test is intended to be used along with a physician's examination of the patient and other laboratory tests as part of a comprehensive evaluation of symptomatic persons to diagnose the disease. The test measures IgM, which is a type of antibody that emerges early in the infection. The assay itself can be performed rapidly, that is to say, within a few hours. Although not a screening test, it is used if someone presents with symptoms such as fever or fatigue or a stiff neck. The test was evaluated in over 1000 patients and very high sensitivity and specificity were demonstrated, in particular in patients with evidence of neurological disease, meningitis or encephalitis. However, the test is not in itself a definitive. It's considered presumptive and must be confirmed with additional more specific testing, but its availability is thought to be a major contribution to the fight against West Nile virus. It also has the potential to help identify the scope and spread of the disease, to determine if there's a need for further work-up in a patient, and as I said, it is rapid, and so it has reduced the turn-around time to the reporting of laboratory results.

Let me just mention immune therapies. The National Institute of Allergy and Infectious Disease at the NIH has awarded a grant to accompany a canvass to develop a vaccine against the West Nile virus [described later by Dr Meegan]. Also scientists at FDA are working developing a live attenuated West Nile vaccine and we have projects to try to develop improved assays to measure the neutralizing antibody that would be expected to be a protective response based on vaccination, and then we are cooperating with sponsors to permit investigational use at NIH of antibody preparations that may prove useful in the treatment of West Nile illness.

Potential Role of Alligators in West Nile Virus Transmission

Alligators might be as effective as birds at transmitting West Nile virus, University of Florida scientists have reported.

The virus is spread by mosquitoes, which transmit it from infected birds. But researchers found levels of the virus in alligators that are as high as in birds, which means that the reptiles can likely pass on the infection to other animals, said Elliot Jacobson, an expert in reptile disease at the university. "They have levels overlapping with that of some birds,

and a certain level needs to be reached in order to infect mosquitoes," Jacobson said. "Horses and humans do not have these levels."

The findings come from a study of about 300 captive alligators that died in 2002 in Christmas [Florida]. Necropsies showed that the alligators had viral loads of West Nile virus that were high enough to infect mosquitoes. The alligators were probably infected initially by mosquitoes, which bite the alligators' soft eyelids, tongues, and mouths, Jacobson said. Then the alligators spread the virus among themselves through water in their holding tanks. Although birds often die within hours of contracting the virus, alligators may live for days or weeks after being infected, Jacobson said. That would allow the alligator to pass the virus on to more mosquitoes.

But overall, Jacobson said alligators probably play a small role in transmitting the virus to mosquitoes and people because there haven't been more human cases in areas with alligators.

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2003 CDC National West Nile Virus Case Summary

United States: West Nile virus activity; Thu 7 to Wed 13 Aug 2003

As of today, August 15, there have been 470 cases of West Nile virus infections in humans reported to the CDC in 25 states and 10 deaths.

This report summarizes West Nile virus (WNV) surveillance data reported to CDC through ArboNET as of 3 am, Mountain Daylight Time, Wed 13 Aug 2003.

During the reporting week of Thu 7 to Wed 13 Aug 2003, a total of 240 human cases of WNV infection were reported from 18 states (Alabama, Arkansas, Colorado, Georgia, Iowa, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, New Mexico, North Dakota, Oklahoma, Pennsylvania, South Dakota, Texas, Wisconsin, and Wyoming), including 5 fatal cases from 2 states (Alabama and Colorado). During the same period, WNV infections were reported in 492 dead birds, 212 horses, one squirrel, and 430 mosquito pools.

During 2003, a total of 393 human cases of WNV infection have been reported from Colorado (195), South Dakota (51), Texas (39), Louisiana (21), Mississippi (14), Pennsylvania (12), Alabama (10), Minnesota (7), Ohio (7), Nebraska (6), North Dakota (6), Florida (4), Iowa (4), Kentucky (3), New Mexico (3), Wyoming (3), Oklahoma (2), Arkansas (1), Georgia (1), Kansas (1), Missouri (1), South Carolina (1), and Wisconsin (1). Among 383 (97 per

cent) cases for which demographic data were available, 213 (54 per cent) were men; the median age was 46 years (range: 17 months to 89 years). Of the 393 cases, 9 fatal cases were reported from Colorado (5), Alabama (2), and Texas (2). In addition, 2262 dead birds with WNV infection were reported from 38 states and New York City; 403 WNV infections in horses have been reported from 27 states (Alabama, Arkansas, Colorado, Delaware, Florida, Georgia, Iowa, Kansas, Kentucky, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, Wisconsin, and Wyoming), 3 WNV infections were reported in dogs, one infection was reported in a squirrel, and 5 infections were reported in unidentified animal species. During 2003, WNV seroconversions have been reported in 261 sentinel chicken flocks from 10 states (Colorado, Delaware, Florida, Georgia, Iowa, Louisiana, Nebraska, North Carolina, Pennsylvania, and Virginia). Louisiana and South Dakota each reported 3 seropositive sentinel horses. A total of 1468 WNV-positive mosquito pools have been reported from 28 states (Arkansas, Arizona, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Maryland, Michigan, Minnesota, Missouri, Mississippi, Montana, Nebraska, New Jersey, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, and Wisconsin) and New York City.

District-Wide Mosquito Data

Overall District Mosquito Update

The US Army Center for Health Promotion and Preventive Medicine –North (USACHPPM-North) tests all mosquitoes collected within the District. Specimens are submitted from Department of Defense Installations, National Park Services and the Department of Health. Thirteen positive mosquito pools have been identified. As of the Pool and Testing Log Report dated 13 August 2003, 5157 female mosquitoes sorted in 607 pools have been processed. 513 pools have been tested; 500 negative, 13 positive. The Department of Health has 428 female mosquitoes awaiting testing. Specimens have been submitted from DoD installations at Walter Reed Army Medical Center and Ft. McNair and the Armed Forces Retirement Home, National Park Services locations at Rock Creek Park, National Capital Parks-East, National Capital Parks-Central and the C & O Canal, East. Department of Health trap locations are located in each Ward of the District.

Eastern Equine Encephalitis: All mosquito pools to date have tested negative for EEE.

Malaria: 3 pools of Anopheles mosquitoes from Ft. McNair tested negative for Vivax malaria by both VecTest and PCR.

Species collected within the District include:
Aedes, Anopheles, Culex, Ochlerotatus

STATUS OF DISTRICT PROGRAMS:

CALL CENTER

- DOH established a West Nile Virus Call Center at 202-535-2323 effective April 11, 2003. Residents and visitors are encouraged to call the Call Center to report standing water, mosquito concerns, and dead birds and to request advice and assistance.
- The Call Center, year-to-date, has received over 281 calls regarding standing water, mosquito infestations, larvicide and dead birds.

HUMAN SURVEILLANCE

- Currently, there are 36 cases of meningitis in the District. DOH is assisting hospitals with reporting these cases. Eight cases are viral, five are bacterial, four are aseptic meningitis and nine are listed as other.
- Eighteen specimens have been tested for West Nile virus; one is pending, 17 have been confirmed negative.
- DOH has contacted all hospitals to review protocol for WNV-suspect cases.
- DOH staff conducts active human surveillance.
- DOH staff distributed West Nile virus Physician Alerts by blast fax to health care providers and hospitals detailing the West Nile virus case definition, reporting and specimen collection and submission criteria.
- DOH staff contacts hospital infectious disease practitioners weekly to determine if any patients meet the testing and reporting criteria, effective May 15.
- DOH staff prepares, processes, transports and submits human specimens for testing.
- In 2001, 20 human samples were submitted for testing. All samples tested negative.
- In 2002, 80 human samples were submitted for testing. Thirty-one samples were positive. Three samples were probable, twenty-eight samples were negative and eighteen samples were considered pending because information was not complete.

MOSQUITO SURVEILLANCE

- Positive Pool Locations (total=13): 3000 blk M St, NW (2 pools); 3000 blk North Capital St, NW (9 pools), 4300 blk Polk St, NE (1 pool), 2700 blk Woodley Pl, NW (1 pool).
- Twenty-four gravid traps have been set for the week of August 11 thru August 17 in Wards 1, 2, 3, 4, 5 and 7.
- Specimens collected from the week of August 11 thru August 17 are as follows; Ward 1-11, Ward 2-19, Ward 3-56, Ward 4-42, Ward 5-31 and Ward 7-47 female mosquitoes. Mosquitoes are sent to US Army Center for Health Promotion and

Preventive Medicine, Ft. Meade, MD to be sorted into pools. (A mosquito pool consists of 1-25 female mosquitoes of a specific genus and species from the same trap, location and trap night.)

- YTD, 2098 female mosquitoes have been collected by DOH and sent for testing.
- The Department of Health currently has 634 female mosquitoes awaiting testing.
- Trapping began the first week in June. Trap locations have been determined.
- DOH staff sets gravid traps, throughout the District in each ward per an established grid pattern. A collaborative effort between DOH, National Park Services (NPS) and the Department of Defense (DoD), ensures that trapping locations incorporate all areas of the District.
- DOH staff set mosquito traps and collect specimens from over 30 traps. Traps are set for 2 trap nights per week. Mosquitoes are sorted, prepared for testing and transported the Ft. Meade, MD for arboviral testing.
- The US Army will test all District mosquito specimens for West Nile and other relevant arboviruses and malaria, depending on species.
- In 2001, 870 pools were collected in the District and submitted for testing. Three pools tested positive.
- In 2002, 1315 pools were collected in the District submitted for testing. 84 pools tested positive, including 5 pools of *Aedes sp.* and 79 pools of *Culex spp.* Locations of positive pools are as follows: 3100 blk Conn. Ave (1), Rock Creek Park (17), Ft. McNair (47), US Soldier and Airmen's Home (19).
- In 2002, there were 19 individual *Anopheles* mosquitoes (possible carrier of malaria) collected and placed into eight pools that were tested for malaria. All pools tested negative.

AVIAN SURVEILLANCE

- 2003: Year to date there have been 168 dead bird reports with the following break-down by ward; Ward 1-10, Ward 2-11, Ward 3-30, Ward 4-28, Ward 5-24, Ward 6-23, Ward 7-24, Ward 8-18.
- | <u>Week</u> | <u>Bird Reports</u> |
|----------------|---------------------|
| April 14-20 | 4 |
| April 21-27 | 3 |
| April 28-May 4 | 6 |
| May 5-11 | 5 |
| May 12-18 | 7 |
| May 18-25 | 3 |
| May 28-June 1 | 26 |
| June 2-8 | 19 |
| June 9-15 | 12 |
| June 16-22 | 7 |
| June 23-29 | 5 |
| June 30-July 6 | 7 |
| July 7-13 | 9 |
| July 14-20 | 16 |
| July 21-27 | 15 |

July 28-August 3 13
August 14-10 16
August 11-17 14

- DOH no longer collects and tests dead birds because West Nile virus is considered endemic in the District. Further positive results of dead bird testing do not provide any relevant information. Information will be collected on sightings of dead birds for empirical information.
- The Smithsonian Institute and the US Army are testing select birds for West Nile and other arboviruses. Year-To-Date, two birds have tested positive. An American Robin collected 7/22 from 1400 blk D Chanute, SW and a Black-crowned heron collected 7/17 from 3100 blk Connecticut Ave, NW.
- Sightings of dead birds are received and compiled at the Call Center. Residents are asked to report the location and physical description of all dead birds. A database will be established and maintained to capture all information.
- Residents are encouraged to dispose of the birds. Specific detailed instructions for disposal are available on the DC Website (dchealth.dc.gov) and at the Call Center (202-535-2323).
- In 2000, the first positive bird was collected on September 28, with a total of 5 positive birds for the year.
- In 2001, the first positive bird was collected on July 10. Nine hundred fourteen (914) birds were collected, four hundred forty-four (444) were tested and three hundred sixty (360) tested positive, with a percent of positivity of 81.08%.
- In 2002, the first positive bird was collected on May 1. Nine hundred five (905) birds were collected, three hundred forty (340) were processed for testing, thirty-one (31) tested negative, one hundred thirty-four (134) were disposed of and one hundred seventy-five (175) birds tested positive with a rate of positivity of 84.95%.
- The positive bird breakdown by ward for 2002 was Ward 1-10, Ward 2-8, Ward 3-123, Ward 4-12, Ward 5-2, Ward 6-7, Ward 7-16, and Ward 8-2.

MOSQUITO CONTROL

- As surveillance data reflects locations of West Nile virus activity, staff will larvicide an eight-square block area surrounding these sites.
- Year-to-date 2003, DOH staff has larviced 3063 catch basins. The Ward breakdown is as follows; Ward 1-188 catch basin; Ward 2-230 catch basins; Ward 3-864 basins; Ward 4-564 basins; Ward 5-417 basins; Ward 6-257 basins; Ward 7-318; Ward 8-215 catch basins.
- Year-to-date 2003, DOH staff has applied larvicidal treatments in alleys with improper drainage, ponds, swamps and park sites in 40 locations, 9 of which are constant bodies of water.
- DOH staff larvicide in response to WNV positive human test results, WNV positive mosquito results, mosquito density and nuisance areas and community concerns. The larvicide, a biological product that kills mosquitoes in the larval stage, is placed in catch basins and in areas of standing or stagnant water.

- In April of 2003, DOH staff began larviciding in the District at locations of positive birds and mosquitoes from the previous year in an eight square block area at each location.
- The larvicide application is repeated approximately every 5-6 weeks.
- Larviciding has been determined to be more effective over a period of time than adulticiding. In 2002, mosquito catches were significantly reduced in areas where larviciding efforts were conducted.
- In 2001, DOH staff larvicided three thousand four hundred ninety-six (3,496) catch basins.
- In 2002, DOH staff larvicided ten thousand eight hundred thirty-five (10,835) catch basins.
- The District does not expect to spray for mosquitoes because of low efficacy; die-offs of non-target species and potential health risks to a high population of persons affected with respiratory problems and compromised immune systems.
- Killing mosquito larvae and eliminating mosquito-breeding sites are the most effective practices to reduce the numbers of mosquitoes.
- The Center for Disease Control and Prevention (CDC) recommends that larvicide be used to reduce mosquito populations.

MAMMAL SURVEILLANCE

- DOH staff conducts passive mammal surveillance.
- DOH staff distributed information to vets, pet shops, and horse stable managers detailing reporting and specimen collection and submission criteria and protocol.
- No mammals have tested positive in the District for the last four years.
- Letters to all veterinarians in the District have been sent to assist veterinarians in recognizing, submitted samples for testing and reporting West Nile virus cases.

OUTREACH AND EDUCATION

- In 2003, year to date, approximately 45,896 brochures have been distributed to elderly homes, day care providers, neighborhood services, door-to-door and to all DC Libraries. Literature has also been available at various events.
- DOH Representatives have participated in 8 media interviews with CNN, Channel 7/8, Washington Post, WHUR Radio, Channel 9, Metro Weekly News, Washington Times and Channel 5.
- DOH has educated participants of the DC Government Safety Fair by setting up a booth, passing out literature and speaking with concerned citizens.
- DOH has prepared an informational brochure emphasizing prevention and protection. The brochure has contact information for the Call Center and website. It has been translated into Spanish, Chinese, Korean and Vietnamese.
- DOH has developed space on the DOH website to provide residents with information, including, the District Arbovirus Surveillance and Response Plan for

2003, methods of controlling mosquitoes, CDC questions and answers, recent press releases and weekly updated surveillance reports.

- DOH has developed an informational script and power point presentation for community presentations.
- In 2002, DOH staff distributed brochures door to door to 46,987 residences, and spoke to residents about prevention and protection techniques. DOH distributed approximately 201,250 brochures in bulk.
- Brochures have been distributed by request to private citizens, day care centers, senior citizen homes, residential housing, hospitals, libraries, schools, parks and recreation centers, churches, other District agencies, NSC Coordinators and all ANC Commissioners.